ABSTRACT

A directionally-sensitive device for detecting and processing vibration waves includes an array of polymeric optical waveguide resonators positioned between a light source, such as an LED array, and a light detector, such as a photodiode array. The resonators which are preferably oriented substantially perpendicularly with respect to incoming vibration waves, vibrate when a wave is detected, thus modulating light signals that are transmitted between the light source and the light detector. The light detector converts the modulated light into electrical signals which, in a preferred embodiment, are used to drive either the speaker of a hearing aid or the electrode array of a cochlear implant. The device is manufactured using a combination of traditional semiconductor processes and polymer microfabrication techniques.